521 M7280 – SATELLITE GEODESY

SPRING SEMESTER 2017

Lab No. 8

handed out Wednesday, May 10, 2017
due Wednesday, May 24, 2017, 09:10 **Name:** _____

Satellite Orbit Visibility: Sky Plot and Ground Track

1. Use the results from your previous lab (Lab No. 7) to plot:

   a. a skyplot of your satellite during a 24-hour period.
   b. a ground track (on a Platte Carrée mapping and a Mercator mapping) of your satellite during a 24-hour period, using COAST4 & MERIPAR5 as background (which are available on the course website).
   c. List the data you use to plot 1a & 1b in a table form.

2. Repeat part 1a & 1b, but mark the visible part of your satellite orbit for an assumed observer (i.e., use different symbols for visible and invisible satellite orbits).

3. Check your skyplot against other commercial software (e.g., Trimble GPS Planning). Does your plot agree with it?

4. Design a "visibility map" to illustrate the availability of your satellite.

5. Discuss your results.

Use for $\boldsymbol{GM} = 398600.4418\left(\mathrm{km}^3/\mathrm{s}^2\right)$, $\omega_e^* = 7292115.8553\times10^{-11}\left(\mathrm{rad/s}\right)$, $\omega_e = 7292115\times10^{-11}\left(\mathrm{rad/s}\right)$, and $\boldsymbol{R} = 6371.000000\left(\mathrm{km}\right)$.

Your (individual) final report should contain (use A4 papers):

- this page as the cover sheet
- source code(s) and outputs; do not forget to add your name and lots of comment cards to the source listing (% .....)
- input and output files from program [input/output values used and calculated], if any
- plots, including captions on axes, title, your name, LB#/HM#, course title, date (if any)
- derivation and description of formulas used, accompanied by figures where applicable
- evidence of computational accuracy
- discussion of results